

REMARKS

This paper is responsive to the November 30, 2006 Office communication. Applicants have revised the claim amendments to ensure that the application includes claims directed to the originally presented subject matter. New dependent Claims 3 and 4 have been added.

Applicants thank Examiner Patel for the analysis contained in the Office Action dated July 18, 2006. In particular, applicants thank the Examiner for the analysis found in the Response to Arguments, as the logic and clarity of this analysis showed where there are areas of agreement and helped to focus the applicants on differences in the art.

Claim Rejections – 35 U.S.C. § 112

Applicants have amended the passage to which the Examiner took exception in paragraph 2 of the Office Action. The independent claim as amended herein now states, in relevant part, "the second circumferential seal being positioned to prevent fluids from migrating along the shaft from the first region of the body to maintain the seal at the first end of the shaft in the event of a failure of the first circumferential seal...". See, e.g., FIGURES 1 and 2.

Regarding the rejection raised in paragraph 4 of the Office Action regarding non-seal elements in the claim, the applicants have amended the independent claim to remove the references to a well, well fluids, and blow out preventer.

No new matter has been added by these amendments.

Claim Rejection – 35 U.S.C. § 102

Claim 1 presently stands rejected under 35 U.S.C. § 102 as being anticipated by Peil (U.S. Patent No. 4,877,217) and by Rasmussen (U.S. Patent No. 1,709,949).

The present invention provides two seals that are dedicated to performing the function of sealing fluids, especially well fluids as described in the present application. This configuration allows drilling operations to continue in the event of a failure of the first seal, as the second seal will perform the required sealing function when the first seal fails. This enables a well drilling operation to be safely completed prior to well shut down.

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^{PLLC}
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100

With the Peil reference a first seal is provided at a first end of a shaft to seal well fluids and a second seal is provided at a second end of the shaft to seal hydraulic fluid. Peil is equipped with a fail safe mechanism that closes the blow out preventer by well pressure to shut down the well immediately and render the blow out preventer inoperative upon a loss of fluid. A leak indicator port 34 is provided to the exterior, so that rig workers can tell from the colour of the leaking fluid what fluids are leaking. If the fluids leaking are well fluids, they know that they have lost their containment.

The Examiner sees parallels between Peil and the present invention. In accordance with the Examiner's analysis, upon the first seal of Peil failing, fluids will tend to migrate along the shaft eventually reaching the second seal of Peil which seals hydraulic fluid. Depending upon the type of seal that is used and the capacity of that seal, the second seal of Peil may serve to hold migrating fluids for a period of time. In any event, in contrast to the present application, the blow out preventer will have become inoperative and drilling operations will have ceased.

The blow out preventer according to Rasmussen relies on pressure from the well to enter inner chambers 119 and 95 to force packers 118 and 85 into engagement with the casing 260. See page 4, lines 76 to 115 of Rasmussen. Otherwise, the packers 118 and 85 are withdrawn from the casing 260. See page 5, line 130 to page 6, line 7. Mechanisms are provided for continuous downward insertion of casing 260 which includes couplings 261. See page 4, line 116 to page 5, line 69. At least some gas is released from the well via exhaust 227 for the blow out preventer of Rasmussen to operate. See page 5, lines 3 to 7.

There are several advantages achieved by the claimed seal assembly over that described by Peil and Rasmussen. In one aspect, applicants are concerned that the Examiner is not taking into account the toxicity of hydrogen sulfide gas in "sour gas" wells. Sour gas can be lethal even in relatively small concentrations. A well must immediately be abandoned upon a loss of containment, which allows the release of sour gas. Applicants further submit that the Examiner is not taking into account the risk of explosion and fire when gas leaks onto a well site. One spark from vehicles and operating equipment on site, can ignite the leaking gas leading to catastrophic results. In addition, drill pipes become lethal missiles when launched out of a well by well bore pressure. When containment is lost, the drilling crew will be running from the site. If there are measures available

to kill the well, they will be initiated before the drilling crew abandons the site. An example of such measures is the pumping of nitrogen down the well to form an ice plug. When such measures are taken, it will take the drilling crew weeks to restore the well to the condition it was in immediately prior to the problem occurring.

Applicants have amended Claim 1 by specifying that the seals in question must be "dedicated" to sealing fluids and must be positioned at the same end of the shaft. There is ample support for such an amendment, in the discussion in the application regarding the second seal being "redundant" and serving no other sealing function. It is respectfully submitted that this distinguishes over the Peil reference, where seals are positioned on a different portion of the shaft and performing a different sealing function. In order to modify Peil in accordance with the teachings of the present invention, seal 30 would have to be paired and, preferably, seal 32 would also be paired. Notably, the seal 32 in Peil does not prevent fluids from migrating along the shaft in the event of a failure of the seal 30. As recognized in the Office Action (page 5, first line), if the seal 30 fails, leakage is indicated in the port 34. To the contrary, the present application states that the "second circumferential seal [is] positioned to prevent fluids from migrating along the shaft from the first region of the body and to maintain the seal at the first end of the shaft in the event of a failure of the first circumferential seal."

As to the disclosure of Rasmussen, the Examiner equates the casing 260 with the shaft identified in the present application. However, it is not evident that the casing 260 has "a second seal travel area which is in contact with the second seal during axial reciprocating movement of the shaft, the second seal area remaining sheltered within the body even when the shaft is in the extended position", nor does the casing 260 have a "first seal travel area and [a] second seal travel area being axially spaced separate and distinct areas on the shaft, such that damage to the exposed portion of the first seal travel area leading to a failure of the at least one first circumferential seal does not lead to failure of the at least one second circumferential seal, as the second circumferential seal engages the second seal travel area which is separate and distinct from the first seal travel area."

In view of the claim amendments, Claim 1 is allowable over Peil and Rasmussen.

New Dependent Claim 3 and 4

A new dependent Claim 3 has been added, which is directed to the specific seal cluster disclosed in the present application. Dependent Claim 3 is fully supported in the specification, in FIG. 1 and FIG 2, and in the paragraph of the specification beginning on page 3, line 32.

Claim 3 is believed to further distinguish over the prior art, and to be allowable as depending from an allowable independent claim.

New dependent Claim 4 restates a feature originally presented in Claim 2 and was later incorporated into Claim 1. Claim 4 is allowable at least for its dependence on Claim 1.

CONCLUSION

In view of the foregoing amendments and arguments, it is respectfully submitted that the present application is now in condition for allowance. Applicants, therefore, respectfully request entry of the amendments and the early issue of a Notice of Allowance.

Respectfully submitted,

CHRISTENSEN O'CONNOR
JOHNSON KINDNESS^{PLLC}



Kevan L. Morgan
Registration No. 42,015
Direct Dial No. 206.695.1712

KLM:jljb

LAW OFFICES OF
CHRISTENSEN O'CONNOR JOHNSON KINDNESS^{PLLC}
1420 Fifth Avenue
Suite 2800
Seattle, Washington 98101
206.682.8100